



Financial Regulation and Bank Failure in Nigeria and USA

Sunday O Igbiosa & Omorose A Ogiemudia

University of Benin, Benin City, Edo State, Nigeria

Abstract

This study examines the influence of financial regulation on bank failure in Nigeria and USA since 1980 - 2018. Secondary data stream and General Least Square (GLS) methodology were adopted. The findings show that the financial regulations of capital adequacy, liquidity ratio and Nonperforming loans have significantly reduced bank failure in Nigeria (except for Credit to private sector). In the USA, capital adequacy and liquidity ratio are the most effective financial regulations that prevented bank failure during the period under review. Causality relationship runs from nonperforming loan, liquidity ratio and private sector credit to bank failure in USA and Nigeria.

Key Word: Financial Institution, Regulation, Banks Failure, GLS, Nigeria and USA

JEL Classification: G210, F33

Paper Classification: Research Paper

Background to the Study

Owing to large scale financial distress in ages, enormous attention on the management of Deposit Money Banks' (DMBs) liabilities and assets is on the increase. The importance of regulation and supervision cannot be over-emphasized for stable and sound financial system as indicated by many countries experience. As the number of numerous financial institutions increase the necessity for financial regulation and supervision becomes greater (Volcker, 1992). Effective regulation and supervision spurs healthy and sound banking industry, maintains customers and investors confidence and ensures that banks adhere to the stipulated rule. To improve banks asset quality, minimize doubtful and bad debt, protect depositors fund, guarantee capital adequacy and banking system stability, the prudential guidelines and deposit insurance scheme were established to reduce bank failures and promote bank performance (Chude & Chude, 2014; Oladipo, 1993; Oguleye, 2005).

It is widely perceived that bank fiasco is more salient than other types of business failure because it has greater negative effect on the economy. Hence, specific bank failure could lead to bank runs and trigger systemic risk in the host economy (Kaufman, 1996). Irrespective of the prevailing economic or political structure in advance and emerging countries at every point in time, bank failures exist in almost every country. Thus, bank failures occupied a major

public policy concern in every country with rigorous regulation than other firms (Kaufman, 1996). In 1989, bank distress condition broke out with *bank panic* which is sudden simultaneous deposit withdrawal by individuals, public sector institutions and government agencies. And this represents early warning signal of certain banks financial weakness like the Commercial trust bank limited and the National bank of Nigeria that was crumbled by management crisis and insider abuse (Nworji, Adebayo & Adeyanju, 2011).

Statement of Research Problem

Regulatory authorities have used insurance scheme on deposit and provident guidelines to manage and build up banks asset worth to reduce bad debt, ensure capital adequacy, liquidity ratio, availability of credit and financial system stability in both developed economy like the United States of America (USA) and emerging economy like Nigeria to reduce bank failures. Researchers have used these safety and soundness regulation, monetary regulation and credit allocation regulation to empirically examine bank failure. Prominent among these studies are Adeyemi (2011), Stoica and Capraru (2009), Nworji, Adebayo and Adeyanju (2011), Chude and Chude (2014), Gummi (2018), Cox, Kimmel and Wang (2017).

Adeyemi (2011) indicated that lack of transparency; huge non performing loans and capital inadequacy in DMBs book are the foremost factors of banks failure in Nigeria. However, the study used primary data and percentage analysis and not secondary data. Nworji, Adebayo and Adeyanju (2011) indicated that corporate governance new code for banks is sufficient to checkmate bank failure in Nigeria. But the study used primary data and correlation analysis which only show strength and direction of relationship without magnitude of effect. Chude & Chude (2014) showed that regulatory inconsistencies have not ensured sound and safe banking operation in Nigeria. But the study used primary data and descriptive desk methodology. Stoica and Capraru (2009), Gummi (2018) found a direct correlation involving financial regulation and banking sector advancement in Romania and Nigeria. But these studies were theoretical in nature without empirical backup to substantiate their assertion. Cox, Kimmel and Wang (2017) revealed that high financial leverage, high risk loans; less liquid asset were the chief factors of bank failures in US throughout the period of financial calamity. The study was conducted in US utilizing 3 years quarterly time series data that ended in 2010.

Obviously, prior empirical studies on financial regulations and bank failure are few in the literature with mixed findings, hence more study is needed. And study that examined the effect of financial regulations of capital adequacy, non-performing loans, liquidity ratio and credit on bank failure using Nigeria and USA within the Ordinary Least Square (OLS) techniques is scarce or not in existence in the literature to the best of my knowledge. The present study fills the identified gaps by investigating the influence of financial regulations on banks failure in Nigeria and US from 1985 to 2018.

Aims of the Study

The comprehensive idea of this research borders on the influence of financial directive on banks fiasco in Nigeria and US. The precise aims are to:

1. Analyze the influence of capital adequacy on bank failure in Nigeria and US.
2. Study the power of non-performing loans on bank insolvency in Nigeria and US.
3. Assess the outcome of liquidity ratio on bank fiasco in Nigeria and US.
4. Test the effect of credit on bank failures in Nigeria and US.

5. Determine the causality relationship between financial regulatory variables and bank failure in Nigeria and USA.

Importance of the Study

The recency of this study and being the first of its kind to use financial regulation of capital adequacy, non-performing loan, liquidity ratio and credit to compare bank failure in Nigeria and US with Ordinary Least Square (OLS) regression techniques make this study unique and imperative to the literature. Also, the findings of this study will give a clear picture and understanding to the apex regulatory body in both Nigeria and USA. It will guide policy makers and investors on how safety and soundness regulation, monetary regulation and credit allocation regulation affect banks failure in Nigeria and US. Finally, the finding of this study will serve as a foundation to other researches, finance student and related discipline that want to broaden the scope of this study for further research.

Literature Review

This section is divided into conceptual literature, theoretical literature and empirical literature.

Conceptual Literature

Most Scholars and Researchers like Gonzalez-Hermosillo (1999), Bongini, Claessens, and Ferri (2001) and Marco (2005) sees failed bank or bank failure as one that either received bailout support or was closed directly, or recapitalized by either the apex bank or a statutory institution explicitly setup to tackle the crisis, and or a bank that needed a liquidity support from financial authority's or the government closed financial institution or the financial firm absorbed / acquired by another healthier financial firm. Causes of banks failure has been classified into economic, political and institutional elements including supervisory and regulatory deficiencies (Ogunleye, 2010). Bank failure could also be attributed to economic recession, hostile policy milieu and management complications (problems) (Ebhodaghe, 1993, 1997). CBN (2001) defined bank failure as the bank with inability to fulfill its capital adequacy requirement, including feeble deposit condition and affected by management problem (as cited in Ekpenyong, 1994). Nigeria Deposit Insurance Corporation (NDIC) sees bank failure as a state of lack of solvency and liquidity crisis. Olufidipe (1992) asserts that bank failure snowballed into depositor's confidence loss that forms the main pillar of banks. Thus, banks attention on concentrating in their environment and advertisement can help eradicate or minimize distress or failure in the sector. Furthermore, when banks liability is higher than their matching assets, this implies that the bank is technically insolvent, thus distressed (Umoh, 1999).

Regulation is a dynamic process. And it means an official regulation made by government or its regulatory agencies. Regulations are exact directions or settled behavior forced by authority or its external agency or an explicit agreement within a sector that guides the business operations and activities of the firms in the sector to obtain the desired objective (Chris, 2003). Olorushola (2003) defined regulation as an embodiment of a specific cause of action of approved conduct either foist by the authority of all tier or clear understanding within the sector that allows and restricts the undertakings and banks operations and other financial firms. In this light, financial regulations ensure that procedures are adhered to, actions are appropriate and undertakings among stakeholders are regulated with regards to sound and proficient financial system (Gummi, 2018). Hence, hub to the proficiency and firmness of financial system is the position that financial regulation occupies.

For financial institution to be effective, financial regulation procedure must vary and acclimatize to the dynamics in its wide-ranging milieu. Due to the nature of banks activities, the industry is placed under high surveillance and scrutiny with the use of regulations in both developed and emerging economies (Paseda, 2012). Llewellyn (2006) opined that regulating and coordinating the financial operation borders on the following targets i) the prudential regulation, aim at the financial stability of individual financial institutions; ii) general supervision and regulation of the total financial and payment structure; iii) the safety of clients against unethical tradition and against inadequate and false information; iv) fair competition assurance, deprived of anti-competition operation. Building and maintaining public confidence in the banking system and keeping customers (depositor) funds is another aim of regulatory activity (Turliuc, 2002). In 1907, the USA witnessed a wave of nine thousand (9,000) bank failures roughly in the great depression. Two thousand three hundred and twenty (2320) banks flopped in the Savings and Loan (S&L) catastrophe. In early 1990's and in the financial calamity of 2008 to 2010, 322 failed banks in general with 25 failing in 2008, 140 failed in 2009, and 157 failed in 2010 respectively in the US (Cox, Kimmel & Wang, 2017).

Theoretical Literature

Agency Theory (AT)

Stiglitz (1989) developed this theory to explain the government aims of protection and safety. Intervention by financial regulatory body is needed to safeguard public funds when intimidated by financial institutions activities. The backbone of this theory is centred on the notion that government and its departments must be conspicuous to coordinate and truncate the prodigality of financial institutions in line with customer protection. The AT also addresses the challenges of clandestine information (adverse selection) and secrete action (moral hazard) respectively which are variants of information asymmetry between managers and owners of the firm (principal) (Jensen & Mecklin, 1976; Sinkey, 1992). Strategies to tackle these shortcomings (challenges), and ensure adequate protection and confidence of depositors in the financial system were also addressed by the agency theory. Jensen and Mecklin (1976) further propagated the agency theory as a tool to resolve the conflict between managers and owners of firms as an extension of the dynamic trade-off theory.

Risk Management Theory

Davis and Harper (1991) developed this theory to explain why risk management, supervision and monitoring are carried out in major banks by regulators in the financial system. The theory emphasizes on the sector degree of risk. Hence, the unstable nature of financial sector needs a proper sanity to guaranty minimal level of risks and participants bear micro cost in the financial system (Currie, 2003).

The Dialectic Regulatory Theory (DRT)

This theory was established to elucidate the correlation between the financial institutions and their regulators, centered on the work of Kane (1981). The regulators try to sanctioned limitations on the financial system (geographic, interest rate and product risk control etc). Organizations with wealth maximization driven intention try to evade regulatory constrains because they perceive such constrains as structural arbitrage. This procedure is toxic (contagion) and creates benefit cost analysis for officers of government for sensitive modification in functioning codes of supervision and control. Generally, the theory examines the effort of both financial institutions and regulators

to achieve their aims. In the process some modification results in supervision and control variation to achieve monetary or financial stability (Gummi, 2018).

Empirical Literature

Considerable number of empirical studies have examined the effect of financial regulations on banks failure. Secrist (1938) investigated bank failure using univariate analysis of 4 ratios methodology over 10 years, findings could not predict bank failure. Hence, more robust statistical techniques were recommended to likely predict bank distress and failure. The use of capital adequacy such as debt-equity ratio and capital to gross revenues ratio to ascertain consequent bank failures were suggested by Estrella, Park, and Peristiani (2000). Das, Quintyn and Kina (2004) used multi cross sectional data and weighted least square techniques to ascertain the influence of regulatory governance on financial system stability. Findings show that supervisory and regulatory governance significantly influences stability of financial system.

Ningi and Dutse (2008) determined the sway of CBN's recapitalization and strengthening of the banking sector in Nigeria. Findings expressed a significant influence of CBN's decision on the market structure, which spurs the efficiency and reliability of banks, produces participant's opportunities and increased their mediating potentials. The survival period of banks in North Cyprus was sustained by low liquidity, low asset value and huge credit given to private sector as reported in the Ordinary Least Square (OLS) regression result of Gonsel (2010). Iganiga (2010) studied the influence of financial regulations on bank effectiveness, adopting data stream from 1986 to 2012 and ordinary least square regression techniques. Finding reveals that financial sector performance is greatly affected by financial regulations in Nigeria. Tatom (2011) used CAMELS regulatory standards rating system and several macroeconomic variables to investigate bank failure in the US. The study used Data Envelopment Analysis (DEA) techniques, and findings indicates that during savings and mortgage foreclosure crisis, the model successfully predicts the failure and survival of commercial banks.

Adeyemi (2011) examined the impact of inadequacy of capital, dearth of transparency and Non Performing Loan (NPL) on the Nigeria bank failure. The study adopted simple percentage analysis and Chi-Square estimation methodology on the collected primary data sourced with questionnaire instrument, findings show that lack of capital (capital inadequacy), dearth of transparency and monumental NPL experienced in the period were the major determinants of bank failure in Nigeria. The conventional CAMELS measures was used by Cole and White (2012) to show that the commercial real estate investments explained the 2009 US banks failure. However, the residential type of mortgage-backed securities failed to do so. In the study of Duchin and Sosyura (2014) after bail out banks received government support from riskier loans they adjusted assets toward riskier securities. Fungacova, Turk and Weill (2015) studied the effects of high (extreme) liquidity generation on bank failure in Russia. The study adopted liquidity creation ratio developed by Berger and Bouwman's (2009) as an extensive surrogate for bank total production. Findings show that high liquidity generation significantly influences bank failure probability in Russia.

Bougatef and Mgadmi (2016) evaluated the influence of regulatory pressures on capital and risk-taking behavior of banks in MENA countries. Panel data of 24 banks functioning in MENA environ from 2004-2012 were sourced and analyzed with panel data regression techniques. Findings uncover specifically that profitability was positively influenced by capital level and strong inverse nexus was found between bank size and risk. Butzbach (2016) explored the link between systemic risk and banking regulation in Italy. Findings discovered that the framework

of macro-prudential regulation may not be adequate to deal with different-related causal factors of systemic risk. Cox, Kimmel and Wang (2017) studied the effects of financial regulations on performance of bank failure in US. The study adopted univariate t-test and probit regression estimation techniques to analyze the thirty-one (31) variables collected. The study finds poor management as a significant determinant of bank crash during the financial calamity (2008-2010) in the US. Iwedi (2017) x-rayed bank failure in Nigeria and factors responsible for it, providing proof from prudential regulatory laxity. Findings discovered that the regulatory authorities are liable and blamable for high rate of bank failure in the Nigeria economy. Gummi (2018) theoretically explained the operations of regulatory bodies and the Nigeria banking sector, in the direction of role, regulatory model and institutional structure. Findings point out a direct association between financial regulation and banking sector advancement in Nigeria.

Hassan (2018) analyzed the Nigeria banking industry with the use of corporate copies of questionnaire to source primary data from each of the 105 bank customers as sample representatives in Gombe northern Nigeria. The study adopted correlation coefficient (Pearson product) to collate and processed the primary data. Findings unveil that various options of failure resolution exist, and some of these resolutions are used to rescue problematic institution from absolute bankruptcy. Allen and Gu (2018) examined the interrelationship between regulations and financial stability, with special focus on panic, contagion and banking crisis owing to fall in asset price. The study discovered that risks engaged in by specific banks are not sufficient and adequate to avoid crises. Omede (2019) theoretically examined how lower borrower are punished during regulatory failure in Nigeria. His detailed analysis showed and concluded that reduction in loan concentration via regulation promotion and competition stimulation is an important catalyst to mitigate access to credit disparity between the rich and poor, and promote greater access to credit.

From prior study reviewed, their corresponding findings were mixed. And most of the studies were country specific study with scanty study in Nigeria on financial regulation and bank failure. More importantly, comparative studies that use Nigeria and US as a case study are very scanty or almost not in existence in the literature to the best of our knowledge, thus more studies are needed. Hence, this study x-rays the power of financial regulation on bank failures in Nigeria and US.

Methodology

This study embraced the longitudinal survey research design. This is a type of ex post facto research design appropriate for a study of this nature because the variables of interest are historical in nature and were collected over a period of time. The study's population covers all banks in Nigeria and US from 1980 to 2017. In order to capture total bank failure that took place over the years in these countries, aggregate annual bank failure data of Nigeria and US from 1980 to 2018 were used as the sample of this study. All data (variables) are annual in nature and were sourced from World Bank Development Index (WDI) website. This study adopted descriptive statistic, correlation analysis and unit root test as preliminary test. The properties of the data were summarized and presented in a convenient way using descriptive statistics. The strength and direction of relationship is tested using Pearson correlation and stationarity test is conducted using Augmented Dickey Fuller (ADF) unit root test. The Ordinary Least Square (OLS) regression technique is adopted to examine the influence of the regressor variables on the explained variable. Finally, Granger causality test is chosen to ascertain the causality relationship between variables under consideration.

The Agency theory serves as the theoretical basis for this study; because the theory clearly explains why financial regulatory intervention is needed for public savings protection when intimidated by the behaviour of financial institutions. This can be expressed mathematically as;

$$FIB = f(FRI).....(1)$$

Where

FIB = Financial Institution Behaviour

FRI = Financial Regulatory Intervention

It is pertinent to point out here that FRI is decomposed into capital adequacy, non-performing loans, liquidity ratio and credit to private sector (CPS). And FBI is decomposed into bank failure. Hence, the operational structure of the model is given as;

$$BFL=f(CAQY,NPL,LIQR,CPS).....(2)$$

The estimated version of the model with standard assumption of constant mean and variance is given as;

$$BFL= \beta_0 + \beta_1 CAQY_t + \beta_2 NPL_t + \beta_3 LIQR_t + \beta_4 CPS_t + \mu_t.....(3)$$

$$BFL= \beta_0 + \beta_1 CAQY_t + \beta_2 NPL_t + \beta_3 LIQR_t + \beta_4 CPS_t + \mu_t.....(4)$$

Where

BFL = Bank failure

CAQY = Capital adequacy

NPL = Non Performing Loan

LIQR = Liquidity Ratio

CPS = Credit to Private Sector

μ_t = Error term

β_0 = Constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = Parameter to be estimated

t = respective variables at current time

A priori Expectation as derived from theoretical and empirical literature is given as:

$$\beta_1, \beta_2, \beta_3, \beta_4 < 0$$

Equation 1.3a is for Nigeria while 1.3b is for USA

Operationalization of Variables

Variables	Code	Measurement	Type	Sign
Bank Failure	BFL	Dummy variable of 1 if banks failed in a particular year otherwise 0	Dependent Variable	
Capital Adequacy	CAQY	$\frac{\text{Total Equity Capital}}{\text{Total loan \& Lease}}$	Independent Variable	-
Non Performing Loan	NPL	Annual unsecured credit facility granted by banks to owners.	Independent Variable	+
Liquidity Ratio	LIQR	$\frac{\text{Total Loan \& Lease Gross}}{\text{Total Deposit}}$	Independent Variable	-
Credit to Private Sector	CPS	Annual credit extended to private sector	Independent Variable	-

Source: Researcher's Computation with E-views (2019)

Data Analysis and Presentation

Descriptive Statistic

Table 4.1 : Summary Statistic

Nigeria Summary Statistic					
	BFL	CAQY	NPL	LIQR	CPS
Mean	0.384615	9.473182	12.13000	82.08821	14.92231
Median	0.000000	10.40500	7.800000	80.10000	13.52000
Maximum	1.000000	17.70000	37.30000	106.7000	38.39000
Minimum	0.000000	0.000000	0.000000	61.27000	8.710000
Std. Dev.	0.492864	4.698559	10.23168	12.43327	5.861074
Skewness	0.474342	-0.509985	0.688973	0.453319	2.612054
Kurtosis	1.225000	3.139922	2.528579	2.297182	10.23239
Jarque-Bera	6.582266	0.971591	1.944227	2.138413	129.3479
Probability	0.037212	0.615208	0.378283	0.343281	0.000000
USA Summary Statistic					
	BFL	CAQY	NPL	LIQR	CPS
Mean	0.256410	10.62429	1.793696	111.6718	150.7018
Median	0.000000	10.50000	1.400000	116.8500	161.6900
Maximum	1.000000	12.74000	5.000000	149.5100	206.3000
Minimum	0.000000	8.400000	0.000000	74.13000	89.13000
Std. Dev.	0.442359	1.446864	1.310243	22.97380	38.24372
Skewness	1.115718	-0.224973	0.980276	-0.432840	-0.195622
Kurtosis	2.244828	1.579034	3.240001	2.058066	1.457231
Jarque-Bera	9.018093	1.943897	3.738807	2.659544	4.116460
Probability	0.011009	0.378345	0.154216	0.264538	0.127680

Source: Researcher's Computation with E-views (2019)

The proportion of mean to median is approximately one (except for BFL) in both countries. This shows that the average values of financial regulation variables is not too different during the sample period. Also, there is a meaningful variation between the highest (Max) and lowest (Min) values in both countries. In Nigeria, only CAQY variable had a long tail to the left from its mean while other have a long tail to the right as indicated by their corresponding negative and positive skewness values respectively. In US, only BFL and NPL have a long tail to the right from its meanwhile CAQY, LIQR and CPS skewed to the left as indicated by their corresponding positive and negative values. CPS and CAQY have a peaked and normal distribution property with the Kurtosis value that is greater (>) 3 and equal to 3 for both variables in Nigeria. While other variables have a flat distribution that is relative to normal, as indicated by Kurtosis values that is < 3. In USA, only NPL has a Kurtosis value that is equal to three (3) which is relative to normal. Other variables have a flat distribution as shown by their corresponding Kurtosis values that are < 3. In Nigeria, only BFL and CPS are not normally distributed since their Jarque-Berra (JB) statistic value is significant when compared to their probability values. All variables are normally distributed (except for BFL) in the USA, since the JB probability of the variables is not significant at 5% and 1% level. Hence, there is need for further preliminary test before the variables are subjected into the econometric model.

Correlation Analysis

Table 4.2 : Correlation Matrix

Correlation t-Statistic Probability	<i>Nigeria Correlation Matrix</i>				
	BFL	CAQY	NPL	LIQR	CPS
BFL	1.00000 ---- ----				
CAQY	-0.226732 -1.041091 0.3103	1.000000 ---- ----			
NPL	0.107853 0.485163 0.6328	-0.158322 -0.717084 0.4816	1.000000 ---- ----		
LIQR	-0.048673 -0.217932 0.8297	-0.340823 -1.621276 0.1206	0.301964 1.416551 0.1720	1.000000 ---- ----	
CPS	0.240036 1.105801 0.2819	0.249138 1.150454 0.2635	0.378370 1.828028 0.0825	0.371202 1.787801 0.0890	1.000000 ---- ----

<i>USA Correlation Matrix</i>					
Correlation t-Statistic Probability	BFL	CAQY	NPL	LIQR	CPS
BFL	1.000000 ----- -----				
CAQY	0.580039 3.103817 0.0058	1.000000 ----- -----			
NPL	0.743092 4.840274 0.0001	0.655781 3.786311 0.0012	1.000000 ----- -----		
LIQR	-0.595873 -3.234240 0.0044	-0.573985 -7.839454 0.0000	-0.645978 -3.688652 0.0016	1.000000 ----- -----	
CPS	0.434164 2.100807 0.0492	0.630642 3.542070 0.0022	0.210703 0.939527 0.3593	-0.485101 -2.418077 0.0258	1.000000 ----- -----

Source: Researcher’s Computation using E-view (2019)

The power and way of the relationship between the explained variable and all the explanatory variables in Nigeria and USA is indicated by the correlation matrix in Table 4.2. In Nigeria, Capital Adequacy (CAQY) and Liquidity Ratio (LIQR) have a very weak negative relationship with bank failure with r coefficient = -0.23 and -0.05 respectively. This points out, that an increase in these variables reduces bank failure in Nigeria. On the other hand, Non Performing Loan (NPL) and Credit to Private Sector (CPS) have a very weak direct association with bank failure in Nigeria with the association values of 0.11 and 0.24 individually. This means that increase in these variables spurs bank failure in Nigeria. In USA, findings show that CAQY, NPL have a strong direct association with bank failure and only CPS has a weak positive relationship with bank failure with the r coefficient of 0.58, 0.74 and 0.43 respectively. LIQR has a strong inverse relationship with bank failure in the USA with the r coefficient value of -0.60 approximately. The correlation matrix also revealed the lack of multi-collinearity amid variables of interest, since none of the correlation coefficient among variables is up to 80%.

Stationarity Test

Table 4.3 : Unit Root Test

ADF Test for Nigeria			
Variables	ADF Stat	Order	Remark
<i>BFL</i>	-4.778944*	I(0)	Stationary
<i>CAQY</i>	-17.63009*	I(0)	Stationary
<i>NPL</i>	-4.081745**	I(0)	Stationary
<i>LIQR</i>	-3.261061***	I(0)	Stationary
<i>CPS</i>	-3.453696***	I(0)	Stationary

Augmented Dickey Fuller Test for USA			
<i>BFL</i>	-3.516400**	I(0)	Stationary
<i>CAQY</i>	-4.985833*	I(1)	Stationary
<i>NPL</i>	-4.303074**	I(2)	Stationary
<i>LIQR</i>	-4.607270*	I(1)	Stationary
<i>CPS</i>	-6.683409*	I(1)	Stationary
Critical Value			
1%	-4.219126	Levels	
5%	-3.533083		
10%	-3.198312		
1%	-4.532598	First Diff	
5%	-3.673616		
10%	-3.277364		
*, **, and *** indicates 1%, 5% and 10% Significance level Individually			

Source: Computation by the Researcher using E-view (2019)

The ADF Statistics shows that all variables in Nigeria were stationary at levels. However, only BFL is stationary at levels in the USA. After taking the first difference of other variables, CAQY, LIQR and CPS were stationary at order I(1). Only NPL became stationary after differencing twice. This indicates that the entire variables are stationary although at different levels. Hence, they are fit for the regression analysis.

General Least Square (GLS) Regression Estimate

Table 4.4 : Regression Result

Nigeria Estimation				USA Estimation			
Variables	Coefficient	T-Stat	Prob Value	Variables	Coefficient	T-Stat	Prob Value
	2.112241	3.723936	0.0034	C	-1.219003	-0.6131	0.5496
<i>CAQY</i>	-0.098555*	-3.623573	0.0040	<i>CAQY</i> (-1)	-0.142347	-0.9648	0.3510
<i>NPL</i>	-0.015786**	-1.913691	0.0520	<i>NPL</i> (-2)	0.305432*	3.4954	0.0036
<i>LIQR</i>	-0.019054*	-2.945745	0.0133	<i>LIQR</i> (-1)	-0.006200	-0.8517	0.4087
<i>CPS</i>	0.057124*	5.027794	0.0004	<i>CPS</i> (-1)	0.017326	1.9321	0.0738
<i>R</i> (2)	-0.565842	-2.220786	0.0483	<i>AR</i> (1)	-0.048713	-0.1588	0.8761
R-Square	0.785711			R-Square	0.651745		
Adj R-Square	0.748918			Adj R-Square	0.527368		
F-Stat	5.518394			F-Stat	5.240085		
Prob Value	0.027596			Prob Value	0.006420		
D.W Stat	2.301221			D.W Stat	1.934862		
* and ** indicates 1%, 5% and 10% Significance level Individually							

Source: Computation by the Researcher using E-view (2019)

The models (Nigeria and USA) show that the entire explanatory variables have different level of relationship with the explained variable. The General Least Square (GLS) method is achieved by Concrete-Ocult Autoregressive technique. Convergence was achieved after 12 and 19 iterations with 18 and 20 observations included for Nigeria and USA respectively. The findings revealed that the models account for about 75% and 53% of total systematic changes in bank failure (BFL)

taken together after adjusted for degree of freedom as shown by the adjusted R² value of 0.75 and 0.53 respectively. 25% and 47% of the systematic changes the models could not account for is captured by the stochastic term. Thus, the models have a good fit of the regression line. The F-statistic value of 5.52 and 5.24 is significant at 5% and 1% level of confidence shows that there is a significant (meaningful) association between all the explanatory variables and BFL taken together. The D.W statistic value of 2.30 and 1.9 can be approximated to 2.0 may show the absence of serial correlation in the model. Hence, the models can be used for policy formulation and recommendation.

Causality Test

Table 4.5 : Granger Causality Test

Nigeria Estimation

Ho: Hypothesis:	Obs	F-Statistic	Sig.
CAQY> BFL	18	1.49252	0.2609
BFL <..... CAQY		0.14232	0.8687
NPL> BFL	18	0.01181	0.9883
BFL <..... NPL		2.38741	0.1309
LIQR> BFL	37	0.54318	0.5862
BFL <..... LIQR		0.53545	0.5906
CPS> BFL	37	1.83169	0.1765
BFL <..... CPS		2.11749	0.1369

USA Estimation

Null Hypothesis:	Obs	F-Statistic	Prob.
CAQY>BFL	19	1.21903	0.3250
BFL <..... CAQY		3.18641	0.0724
NPL> BFL	21	2.99858	0.0783
BFL <..... NPL		1.75237	0.2050
LIQR> BFL	37	2.74015	0.0797
BFL <..... LIQR		1.96271	0.1570
CPS> BFL	37	3.55617	0.0403
BFL <..... CPS		1.53701	0.2305

Source: Researcher’s Computation using E-view (2019)

Findings in Table 4.5 point out that causality runs from Bank Failure (BFL) to Non Performing Loan (NPL) and CPS in Nigeria and not the other way. Also, NPL, LIQR and CPS granger cause BFL in USA and not the other way. Only BFL granger cause capital adequacy (CAQY) in the USA. Finally, causality relationship was not found between CAQY and LIQR in Nigeria. This means that Nigeria regulatory bodies were more reactive in curtailing bank failure during the study period because bank failure occurred or show early warning signal before policies are aggressively enforced to salvage the situation. But this position is not the same in the U.S because the

regulatory body are rather proactive than been reactive in preventing bank distress, as evidence that causality results.

Discussion of Findings

All the explanatory variables of interest pass their significance test in the case of Nigeria at 1% and 5% confidence level as pointed out by the t-statistic value, when compared to their corresponding probability value that is significant. In USA, only the NPL pass its significant test at 1% level of significance. In Nigeria's case, CAQY, NPL and LIQR have a significant negative effect on bank failure. This means that increase in these financial regulation variables over the years has significantly reduced bank failure in Nigeria during the period under review. Also CPS has a significant positive effect on bank failure, indicating that this financial regulation variable has not achieved the desired objective of reducing bank failure in Nigeria. This could be attributed to the reality that credits to the private sector were not channeled into manufacturing activities rather bulk of the credit were invested in portfolio investment in the capital market. This finding conforms to that of Iganiga (2010) and Gunsel (2010) in the literature.

In the USA, financial regulation variables of Capital Adequacy (CAQY) and Liquidity ratio (LIQR) reduced bank failure insignificantly with their corresponding negative coefficient. Nonperforming Loan (NPL) and Credit to Private Sector (CPS) failed to prevent bank failure in the USA, due it corresponding negative coefficient. This finding is in line with that of Adeyemi (2011) and Cox, Kimmel and Wang (2017) in the literature. Furthermore, the use of these regulatory variables in U.S and Nigeria by the apex banks individually has yielded the desired result more in reducing bank failure in Nigeria. This could be related to the nascent and fragile nature of the Nigerian financial system and the need to strengthen her banking sector in order to compete with her counterpart in the globe. This suggested that Nigerian banks have more experience in managing their risk levels via diversification.

Conclusion and Recommendation

Conclusively, the risky nature of bank operations, bank operators' haphazard ambition, technological innovation, financial liberalization and globalization of operation posed challenges and informed the selection of prudential and supervisory actions that is in line with international standards best practices with respect to banking operations in Nigeria and USA. In the light of the above, the influence of financial regulation on bank failure in Nigeria and USA is investigated spanning 1980 - 2018. Secondary data and General Least Square (GLS) methodology was adopted. To an extent, the findings show that the financial regulations of capital adequacy, liquidity ratio and Nonperforming loans have significantly reduced bank failure in Nigeria (except for Credit to private sector). In the USA, capital adequacy and liquidity ratios are the most effective financial regulations that prevented bank failure during the period under review. From the findings, it is concluded that prudential regulatory guidelines (Basel Framework) and deposit insurance have enhanced loan worth provisioning and bank loan assets. Fundamentally, the application of financial regulation has regulated and moderated banks' profit and also enhanced the provision for bad and doubtful debts, thereby, promoting safety and soundness in the sector. From the foregoing the following recommendations were made;

1. Capital adequacy, Non-performing loan, Liquidity ratio and Credit to private sector risk factors should be taken into cognizant by regulators and bank management especially in Nigeria, via safety, soundness and monetary policy to avoid distress in the financial sector that could snowball bank failure.

2. Regulatory authorities should also come up with more strict limits on excessive concentration and risk taking operation in both countries.
3. Constricted provisioning conditions on nonperforming loans are crucial in ensuring that banks remain liquid during economic downturns in both countries.
4. More effort should be put in place by regulatory authority through credit allocation regulation to checkmate Credit extended to private sector in both Nigeria and USA, in order to have the desired objective of preventing bank failure.
5. The regulatory authorities must continue to beam their searchlight on the banking sector with a view to dealing decisively with the erring banks to avoid any contagion arising from the systemic distress which is a common rarity in the sector.

References

- Adeyemi, B. (2011). Bank failure in Nigeria: A consequence of capital inadequacy, lack of transparency and non-performing loans?, *Banks and Bank Systems*, 6(1), 99-109.
- Allen, F. & Gu, X. (2018). The interplay between regulations and financial stability. *Journal of Finance Service Resources*, 53, 233-248.
- Bongini, P., Claessens, S. & Ferri G. (2001). The political economy of distress in East Asian financial institutions. *Journal of Financial Services Research*, 19(1), 23-37.
- Bougatef, K. & Mgadmi, N. (2016). The impact of prudential regulation on bank capital and risk-taking: The case of MENA countries. *The Spanish Review of Financial Economics*, 14(2), 51-56.
- Butzbach, O. (2016). Systemic risk, macro-prudential regulation and organizational diversity in banking. *Policy and Society*, 35(3), 239-251.
- Chris, O. (2003). *Financial regulation in Nigeria and challenges of the West African monetary zone*. (Seminar on the Issues in Financial Institutions Surveillance in Nigeria Publication of CBN Training Centre, Lagos. No.3), Nigeria: 100-111.
- Cole, R. A., & White, L. J. (2012). Deja vu all over again: The causes of US commercial bank failures this time around. *Journal of Financial Services Research*, 42(1), 5-29.
- Cox, R.A.K., Kimmel, R.K. & Wang, G.W.Y. (2017). Drivers of us bank failures during the financial crisis. *International Journal of Business and Management*, 12(8), 19-36.
- Chude, N.P. & Chude, D.I. (2014). The relationship between regulatory inconsistencies and Nigerian banking industry. *Research Journal of Finance and Accounting*, 5(13), 67-75.
- Das, S. U., Quintyn, M. & Kina, C. (2004). *Does regulatory governance matter for financial system stability? An empirical analysis*. (IMF Working Paper No. WP/04/89). IMF.
- Davis, K. & Harper, I. (1991). Risk management in financial institutions. Allen and Unwin, Melbourne. *Journal of Risk Management*, 3(1), 8-21.
- Duchin, R., & Sosyura, D. (2014). Safer ratios, riskier portfolios: banks' response to government aid, *Journal of Financial Economics*, 113(1), 1-28.
- Ebhodaghe, J.U. (1993). The role of ndic in the management of distressed banks. *NDIC Quarterly Journal*, 3(1), 5-21.
- Ebhodaghe, J.U. (1997). Safe and sound bonding practices in Nigeria: Selected Essays. NDIC Publication, Lagos NDIC.

- Ekpenyong, D.B. (1994). Financial distress in banks, nature and implication. *The Nigerian Banker Publication*, 2(1), 123-145.
- Estrella, A., Park S. & Peristiani, S. (2000). *Capital ratios as predictors of bank failure*. Economic Policy Review, Federal Reserve Bank of New York, 33-5.
- Fungacova, Z., Turk, R. & Weill, L. (2015). High liquidity creation and bank failures in Russia. (IMF Working Paper No. 8). Russia: 3-33.
- Gonzalez- Hermosillo, B. (1999). *Determinants of ex-ante banking system distress: A macro-micro empirical exploration of some recent episodes*. (IMF Working Paper No. 33). USA; IMF, 4-24.
- Gunsel, N. (2010). Determinants of the timing of bank failure in North Cyprus. *The Journal of Risk Finance*, 11(1), 89-106.
- Gummi, U.M. (2018). Financial regulations and the Nigeria's banking sector. *Journal of Research in Business and Management*, 3(11), 05-13.
- Hassan, M. (2018). Evidence determination of bank failure eradication in the 21st century Nigeria. *Journal of Business & Financial Affairs*, 7(2), 1-5.
- Iganiga, B. O. (2010). Evaluation of the Nigerian financial sector reforms using behavioral models, *Journal of Economics*, 1(2), 65-75.
- Iwedi, M. (2017). Bank failure in Nigeria: Evidence of prudential regulator laxity. *Frontiers in Management Research*, 1(4), 141-150.
- Jensen, M.C. & Meckling, W.H. (1976). Theory of the Firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Kane E. J. (1981). Accelerating inflation, technological innovation and the decreasing effectiveness of banking regulation. *Journal of Finance*, 8(36), 355-67.
- Kaufman, G.G. (1996). *Bank failures, systemic risk, and bank regulation* (Financial Regulation Research Department Federal Reserve Bank of Chicago No. WP-96-1). USA: 2-40.
- Llewellyn, D. (2006). *Institutional structure of financial regulation and supervision: The basic issues*. Paper presented at a World Bank seminar Aligning Supervisory Structures with Country Needs, Washington DC, 6th and 7th.
- Ogunleye, G. (2010). The causes of bank failure and persistent distress in the banking industry: Perspectives on the Nigerian financial safety-net, Nigeria. Retrieved from <http://ndic.org.ng/files/Perspectives%20%20On%20the%20Nigerian%20Financial%20Safety-net%20NDIC%202.pdf>
- Omede, P.I. (2019). A tale of two markets: How lower-end borrowers are punished for bank regulatory failures in Nigeria. *Journal of Consumer Policy*, 43, 519–542.
- Marco, A. (2005). Bank failures and bank fundamentals: A comparative analysis of Latin America and East Asia during the nineties using bank-level data. *Bank of Canada Working Paper*, 19, 34-65.
- Ningi, S. I. & Dutse, A. Y. (2008). The impact of bank consolidation strategy on the Nigerian Economy. *African Economic and Business Review*, 6(2), 56-67.
- Nworji, I.D., Adebayo, O. & Adeyanju, O.D. (2011). Corporate governance and bank failure in Nigeria: Issues, challenges and opportunities, *Research Journal of Finance and Accounting*, 2(2), 1-19.
- Olorunshola, A. J. (2003). Financial system regulation in Nigeria: Theoretical framework and institutional arrangements. *Publication of CBN Training Centre, Lagos*, 3, 18-25.

- Olufidipe, E. O. (1992). Fraud in Nigeria and its implication for bank and financial institutions. *Journal of Nigeria Institute of Bankers Lagos*, 30, 7-10.
- Paseda, O. (2012). Banking regulation in Nigeria: A review article (October 2012), Nigeria. Retrieved from <https://ssrn.com/abstract=2900252>.
- Secrist, H. (1938). *National Bank Failures and Non-failures: An Autopsy and Diagnosis*, Bloomington, Indiana: The Principia Press.
- Sinkey, J. (1992). *Commercial banks financial management*. Nigeria: Maxwell MacMillan.
- Stiglitz, J. (1981). Financial market and development. *Oxford Review of Economic Policy*, 5(5), 55-68.
- Stoica, O. & Capraru, B. (2009). Lessons regarding bank failures: an overview. *Analele Stiintifice Ale Universității Alexandru Ioan Cuza Din Iasi*, 5(3), 158- 164.
- Tatom, J. (2011). Predicting failure in the commercial banking industry. *Munich Personal RePEc Archive MPRA*, 2(13), 2-34.
- Turluc, V. (2002). Politici monetare, Polirom, Iasi; Bank failures in mature economies. BCBS Working Papers no. 13, April 2004. Retrieved from <https://www.bcbs.org/bankfailure/>
- Umoh, P.N. (1999). A decade of deposit insurance in Nigeria: Issues and challenges, Lagos, NDIC Publication, 4(2), 18-41.

Author's Profile

Sunday O Igbinosa is an Associate Professor of Finance, and a former Head, Department of Banking and Finance. His teaching and research areas include Corporate and Development Finance, Advanced banking processes and management, Quantitative techniques and Capital market studies. His teaching and research experience spans over two decades with both private and public Universities in Nigeria. He is a management consultant to States and Corporate organizations; and an external examiner to a number of Universities within and outside Nigeria, and an examiner to Professional Examination bodies.

Aigbedo Omorose Ogiemudia is working in Department of Banking and Finance, Faculty of Management Sciences, University of Benin, Edo State, Nigeria. His areas of research interests are Banking and Finance, Financial Analysis and Investments.